

REMARKS

Applicants thank the Examiner for the thorough examination given the present application.

Status of the Claims

Upon entry of the present amendment, claims 1-2 and 4-7 will be pending in the present application. Claims 1 and 4 have been amended. Claims 3 and 8 have been cancelled herein. Support for the recitations in claim 1 can be found, *inter alia*, in Example 4 of the present specification. No new matter has been added by way of the above amendments.

Applicants submit that the present Amendment is merely formal in nature, reduces the number of issues under consideration, and places the case in condition for allowance. Entry of the present amendment is proper to place the claims in better form for appeal.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Issues under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto et al. '388 (US 6,037,388) in view of Nishimura et al. '641 (US 5,281,641) when taken with Wakumoto et al. '061 (US 5,122,061).

Applicants respectfully traverse. Reconsideration and withdrawal of this rejection are respectfully requested.

The Present Invention

The polymerization initiator composition, which is the subject matter of claim 1 of the present application, comprises:

- (i) 100 parts by weight of (A) partially oxidated tributylboron,
- (ii) 5 to 40 parts by weight of (B) an aprotic solvent, and
- (iii) 0.2 to 1.5 parts by weight of (C) ethanol.

The polymerization initiator composition is characterized in that it comprises 0.2 to 1.5 parts by weight of (C) ethanol as described above.

That is, the partially oxidized tributylboron (A) reacts with the ethanol or the aprotic solvent such as water to decompose and thereby loses its polymerization activity. Therefore, one of ordinary skill in the art would not use the partially oxidized tributylboron in combination with ethanol. However, the present specification at page 6, lines 20-24 recites:

Surprisingly, the alcohol (C) in the initiator composition of the present invention suppresses heat generation (ignition) without reducing polymerization activity in the presence of the aprotic solvent (B) when it is added in a specific small amount.

This disclosure was totally unknown and unpredictable to one of ordinary skill in the art.

Distinctions over the Cited References

As discussed above, independent claim 1 recites a polymerization initiator composition that comprises “0.2 to 1.5 parts by weight of (C) ethanol.” In stark contrast, Hashimoto et al. ‘388 do not disclose 0.2 to 1.5 parts of ethanol.

Nishimura et al. ‘641 disclose a dental adhesive composition comprising a polar organic compound in an amount of 10 mole% or less of an organic boron compound (col. 3, lines 1-26). However, Nishimura et al. ‘641 fail to disclose ethanol. Rather, Example 2 of Nishimura et al. ‘641 discloses a paste containing 4 parts by weight of diamylmonoamyloxy boron and 0.1 part by weight of isoamyl alcohol (6.8 mol equivalent % based on the curing agent, i.e., diamylmonoamyloxy boron).

Since the molar weights of diamylmonoamyloxy boron and isoamyl alcohol are 240 and 88, respectively, the molar ratio of 0.1 part by weight of isoamyl alcohol to 4 parts by weight of diamylmonoamyloxy boron is 6.8 mol equivalent % $((0.1/88) / (4/240) = 0.068)$ as described above. Therefore, the ratio (parts by weight) of ethanol (molar weight of 46) to 100 parts by weight of monooxidated tributyl boron (molar weight of 198) which is a typical example of partially oxidized tributyl boron is calculated as 1.58 parts by weight based on 100 parts by weight of partially oxidized tributyl boron from the following equation:

$$(x/46) / (100/198) = 0.068$$
$$x = 1.58$$

Consequently, the above value of 1.58 parts by weight of ethanol exceeds the upper limit value of 1.5 parts by weight of the content of ethanol in amended claim 1.

In other words, Nishimura et al. '641 fail to disclose ethanol as the polar organic compound which is used in combination with the organic boron compound and the content of ethanol in the present invention. Consequently, Nishimura et al. '641 do not disclose that ethanol suppresses heat generation without reducing polymerization activity in the presence of the aprotic solvent when it is added in a specific amount of 0.2 to 1.5 parts by weight based on 100 parts by weight of the partially oxidized tributyl boron.

For the reasons given above, Hashimoto et al. '388 in view of Nishimura et al. '641 do not disclose each and every aspect of claim 1, from which the other pending claims ultimately depend. Applicants respectfully submit that Wakumoto et al. '061 do not overcome the deficiencies of these references.

To establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be disclosed by the cited references. As discussed above, the cited references fail to disclose all of the claim limitations of independent claim 1, and those claims dependent thereon. Accordingly, the combination of references does not render the present invention obvious. Furthermore, the cited references or the knowledge in the art provide no reason or rationale that would allow one of ordinary skill in the art to arrive at the present invention as claimed. Therefore, a *prima facie* case of obviousness has not been established, and withdrawal of the outstanding rejection is respectfully requested. Any contentions of the USPTO to the contrary must be reconsidered at present.

CONCLUSION

A full and complete response has been made to all issues as cited in the Office Action. Applicants have taken substantial steps in efforts to advance prosecution of the present application. Thus, Applicants respectfully request that a timely Notice of Allowance issue for the present case clearly indicating that each of claims 1-2 and 4-7 are allowed and patentable under the provisions of title 35 of the United States Code.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad M. Rink, Reg. No. 58,258 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Dated:

March 16, 2009

Respectfully submitted,

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